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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,646	06/08/2000	Vernon M. Williams	4210US (99-0173)	1022

7590 03/21/2008  
Joseph A Walkowski  
Trask Britt & Rossa  
P O Box 2550  
Salt Lake City, UT 84110

EXAMINER
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MITCHELL, JAMES M

ART UNIT	PAPER NUMBER
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2813

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03/21/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/590,646	<b>Applicant(s)</b> WILLIAMS ET AL.	
	<b>Examiner</b> JAMES M. MITCHELL	<b>Art Unit</b> 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-69 and 142-207 is/are pending in the application.
- 4a) Of the above claim(s) 3,9,32,38,50 and 54 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 142-207 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-16,20-31,33-37,39,43-49, 51-53,55,56,60- 69 is/are rejected.
- 7) ☒ Claim(s) 17-19,40-42 and 57-59 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is in response to the request for continued examination filed January 14, 2008.

#### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a flip-chip BGA having a conductive center surrounded by a first member must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4-8, 10-16, 20-24, 26-31, 33-37, 39,43-49, 51-53, 55,56,60-65 and 67- 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subrahmanyam et al. (U.S. 5,411,400).

5. Subrahmanyam (Fig. 1, 8, 9) discloses:

(cl. 1, 22, 26, 27-30, 35, 36, 47, 48, 64, 65, 67, 68) a conductive structure for connecting a contact pad of a semiconductor device/flip-chip/CSP or semiconductor die with bond pads arranged in an array on a surface thereof and a contact-pad of a substrate/carrier substrate (e.g. carries chip), comprising: a female member/2<sup>nd</sup> member (42) configured to be secured to the contact pad (23) of one of the semiconductor device (11) and the substrate (13/22), said female member having: a jacket (e.g., understood to mean any outer surface of a member, e.g. 34) with an aperture/ receptacle (e.g. terminal, 32 inserted in; not labeled) configured to be located over the contact pad; and a conductive center partially filling said aperture (e.g. member with a recess/aperture with bottom) that with an upper portion of said aperture being open (Fig. 9); and a male member/1<sup>st</sup> member (32) configured to be secured to the corresponding contact

Art Unit: 2813

pad of the other of the substrate (22) and the semiconductor device, said male member having: a jacket having an end (e.g. surface of 37) configured complementarily to said upper portion of said aperture of said jacket of said female member (32; Fig. 9), said jacket having an aperture configured to be located over the corresponding contact pad; and a conductive center substantially filling said aperture (see footnote 1);

(cl. 2, 52) wherein said aperture of said jacket of said female member (42) is configured to partially limit insertion of said male member thereinto (e.g. bottom & sides of 42 limit; see e.g. Fig. 9);

(cl. 4, 13, 33, 39, 51, 55) the aperture tapers inwardly<sup>1</sup> (aperture portion of 39; Fig. 8, 9);

(cl. 5) an outer surface of jacket (37) of said male member is configured to partially limit insertion of said male member into said aperture of said jacket of said female member (Fig. 9);

(cl. 6, 7, 34, 36, 56) wherein said outer surface is tapered (e.g. portion of 37 next to 34) and like a cone so therefore frustoconical;

(cl. 8, 31, 49, 53) wherein said jacket of said male member has an end (e.g. tip of 37 closest to 29) portion with a smaller periphery than a base portion of said jacket (e.g. wide portion of 37; See Fig. 1, top-down view);

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<sup>1</sup> Note, although shown in the prior art, even if the feature were not shown, they still would be considered obvious in light of any standard chip socket (e.g. Kardon, U.S. 5,418,471) since applicant has not disclosed that his claimed shapes are unobvious or otherwise critical. See M.P.E.P 2144.04[R-1]

Art Unit: 2813

(cl. 11, 46, 63) the male and female member formed of a material that when viewed microscopically is composed of superimposed, contiguous mutually adhered layers;

(cl 12) said aperture of said jacket of said female member is configured to facilitate alignment of said male member and said female member (Fig. 1);

(cl. 14) wherein an outer surface of said jacket of said male member is configured to facilitate alignment of said male member and said female member (e.g. shape of hole aligned also with shape of jacket (Fig. 1);

(cl. 15) wherein said outer surface tapers outward-from said-end (e.g. tip of 37) to a base portion (e.g. widest portion of 37) thereof;

(cl 16) and the outer surface (37) is cone shape and therefore frustoconical;

(cl. 21, 44) wherein at least one of said conductive centers comprises a solder, a metal, or a metal (Col. 2-3, Lines 66-1);

(cl. 37) wherein an upper portion (e.g. outermost portion of 39) of said aperture has a larger periphery than a base portion of said aperture (e.g. where 29 meets 34);

(cl. 69) wherein the semiconductor is a semiconductor (Col. 3, Lines 19-20).

6. Subrahmanyam does not disclose its male and female connector comprised of multiple pieces such that a member surrounds a periphery of a center conductive portion or the claimed materials for its male or female member.

7. However, applicant has not disclosed that his breaking a known structure into a different shape or multiple pieces produces unexpected results or otherwise critical. As such, the forming the individual elements such as a

Art Unit: 2813

conductive member laterally surrounded by a female member would have been obvious to one of ordinary skill in the art, since it has been held that making integral items separable or visa-versa is prima facie obviousness. Cf., *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, “that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.”), See M.P.E.P§2144.04.

8. Indeed, it has been held that mere shapes/ dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)(The court held that the configuration of the claimed disposable plastic nursing container was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant.); *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Art Unit: 2813

9. With respect to selected material of claims 10, 22, 45, 46, 62 and 63 being a photopolymer, the selection would have been obvious, since it has been held that the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See M.P.E.P.

§2144.07.

10. Claim 25 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subrahmanyam et al. (U.S. 5,411,400) in combination with Abe et al. (U.S. 5,646,442).

11. Subrahmanyam discloses the same invention as claimed in paragraphs 5-9 of this office action except that his chip package is cylindrical instead of a BGA, Abe (Fig. 2A, 4) shows that for a socket connection terminals that cylindrical terminals are equivalent to BGA structure known in the art. Therefore, because these two contact structures are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute Ball type terminals for cylindrical ones.

### ***Response to Arguments***

12. Applicant's arguments filed January 14, 2008 have been fully considered but they are not persuasive.

13. Applicant contends that his invention is patentable over the prior art, because Subrahmanyam a conductive material filling an aperture. Most notably applicant has further amended his claim to recite that the center is laterally

Art Unit: 2813

surrounded by a female member. Examiner acknowledges that the amendment does impart a structural feature that is different than Subrahmanyam; a discrete ring/female member must surround a discrete conductive center. However, the differences amounts to merely how applicant has separated a known item (e.g. female member) into known parts (ring & conductive center). The simple arrangement of known parts to form a female member that functions generally in the same manner as that which is known in the art does give rise to the level of invention necessary for the grant of a patent as anticipated by *Hotchkiss v. Greenwood*, 11 How. 248 (1851) and followed by its progeny.

14. The case of *Hotchkiss v Greenwood*, 52 U.S. 248 (1852) dealt with doorknobs made of porcelain (putative invention) versus wood (prior art). The Supreme Court made the decision that for an invention to be patentable, it not only has to be useful and new, but it also has to consist of a substantial improvement over the prior art, not only a slight modification that the "skilled artisan" could make. This concept was codified into the US Patent Act of 1952 as 35 U.S.C 103.

15. For over a half century, the Court has held that a "patent for a combination which only unites old elements with no change in their respective functions . . . obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men." *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U. S. 147, 152 (1950).

16. In *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U. S. 57 (1969), the Court elaborated on this approach. The subject matter of the patent

Art Unit: 2813

before the Court was a device combining two pre-existing elements: a radiant-heat burner and a paving machine. The device, the Court concluded, did not create some new synergy: The radiant-heat burner functioned just as a burner was expected to function; and the paving machine did the same. The two in combination did no more than they would in separate, sequential operation. *Id.*, at 60-62. In those circumstances, "while the combination of old elements performed a useful function, it added nothing to the nature and quality of the radiant-heat burner already patented," and the patent failed under §103. *Id.*, at 62.

17. Similarly in *Sakraida v. AG Pro, Inc.*, 425 U. S. 273 (1976), the Court derived from the precedents the conclusion that when a patent "simply arranges old elements with each performing the same function it had been known to perform" and yields no more than one would expect from such an arrangement, the combination is obvious. *Id.*, at 282.

18. Because applicant has done nothing more than arranged old elements, such that they perform the same way as what was known in the art, the claimed invention is prima facie obvious.

19. Lastly in regards to applicant's other remarks to attempt to distinguish his invention over the prior art, he has done nothing but simply restate that the prior art fails to show a particular feature recited in the claim, without rebutting examiner's rejection on how that feature had been met by the prior art.

Applicant's argument amounts to mere conjecture, which is insufficient to overcome examiner's prima facie case. See M.P.E.P 2145. Failure by applicant

Art Unit: 2813

in the next office action to distinctly and specifically point out the supposed errors in the examiner's action will be treated as a non-responsive. See 37 CFR 1.111(b).

***Allowable Subject Matter***

20. Claims 17-19, 40-42, 57-59 and 142-207 are allowed.

21. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose or make obvious either the male or female member comprising at least an unconsolidated conductive material.

***Conclusion***

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art in Alcoe (U.S. 2002/0046856) discloses a female member/ring laterally surrounding a conductive member.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES M. MITCHELL whose telephone number is (571)272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2813

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carl Whitehead Jr./  
Supervisory Patent Examiner, Art Unit 2813

Ex. Mitchell  
March 14, 2008  
/James M. Mitchell/  
Examiner, Art Unit 2813